



## SEQUENCE LISTING

## (1) GENERAL INFORMATION:

(i) APPLICANT: Rybak, Susanna M.  
Cara, Andrea  
Gusella, Gabriele Luca  
Newton, Dianne L.  
The Government of the United States of America  
as represented by the Secretary,  
Department of Health and Human Services

(ii) TITLE OF INVENTION: Vectors for Delivering Viral and  
Oncogenic Inhibitors

(iii) NUMBER OF SEQUENCES: 23

(iv) CORRESPONDENCE ADDRESS:  
(A) ADDRESSEE: Townsend and Townsend and Crew LLP  
(B) STREET: Two Embarcadero Center, Eighth Floor  
(C) CITY: San Francisco  
(D) STATE: California  
(E) COUNTRY: USA  
(F) ZIP: 94111-3834

(v) COMPUTER READABLE FORM:  
(A) MEDIUM TYPE: Floppy disk  
(B) COMPUTER: IBM PC compatible  
(C) OPERATING SYSTEM: PC-DOS/MS-DOS  
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30

(vi) CURRENT APPLICATION DATA:  
(A) APPLICATION NUMBER: US 09/230,195  
(B) FILING DATE:  
(C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: US 60/022,052  
(B) FILING DATE: 22-JUL-1996

(viii) PRIOR APPLICATION DATA:  
(A) APPLICATION NUMBER: WO PCT/US97/12637  
(B) FILING DATE: 17-JUL-1997

(ix) ATTORNEY/AGENT INFORMATION:  
(A) NAME: Lockyer, Jean M.  
(B) REGISTRATION NUMBER: 44,879  
(C) REFERENCE/DOCKET NUMBER: 015280-284100US

(x) TELECOMMUNICATION INFORMATION:  
(A) TELEPHONE: (415) 576-0200  
(B) TELEFAX: (415) 576-0300

## (2) INFORMATION FOR SEQ ID NO:1:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 588 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

## (ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..588
- (D) OTHER INFORMATION: /note= "encephalomyocarditis virus internal ribosome entry site (IRES)"

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

|            |            |            |             |            |             |     |
|------------|------------|------------|-------------|------------|-------------|-----|
| ATTCCCCCCC | TCTCCCTCCC | CCCCCCCTAA | CGTTACTGGC  | CGAAGCCGCT | TGGAATAAGG  | 60  |
| CCGGTGTGCG | TTGTCTATAT | GTTATTTCC  | ACCATATTGC  | CGTCTTTGG  | CAATGTGAGG  | 120 |
| GCCCGGAAAC | CTGGCCCTGT | CTTCTTGACG | AGCATTCTA   | GGGGTCTTTC | CCCTCTCGCC  | 180 |
| AAAGGAATGC | AAGGTCTGTT | GAATGTCGTG | AAGGAAGCAG  | TTCCTCTGGA | YYCTTCTTGA  | 240 |
| AGACAAACAA | CGTCTGTAGC | GACCCTTGCG | AGGCAGCGGA  | ACCCCCCACC | TGGCGACAGG  | 300 |
| TGCCTCTGCG | YYCAAAAGCC | ACGTGTATAA | GATACAGGTG  | CAAAGGCGGC | ACAACCCCAG  | 360 |
| TGCCACGTTG | TGAGTTGGAT | AGTTGTGGAA | AGAGTCAAAT  | GGCTCTCCTC | AAGCGTATTG  | 420 |
| AACAAGGGGC | TGAAGGATGC | CCAGAAGGTA | CCCCATTGTA  | TGGGATCTGA | TTTGGGGCCT  | 480 |
| CGGTGCACAT | GCTTACATG  | TGTTTAGTCG | AGGTTAAAAAA | ACGTCTAGGC | CCCCCGAACCC | 540 |
| ACGGGGACGA | GGTTTTCCCT | TTGAAAAACA | CGATGATAAG  | CTTGCCAC   |             | 588 |

## (2) INFORMATION FOR SEQ ID NO:2:

## (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 44 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

## (ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..44
- (D) OTHER INFORMATION: /note= "intervening sequence between IRES and EDN sequences in pBAR-EDN"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

CTAGAAATAA TTTGTTAA CTTAAGAAG GAGATATACA TATG

44

(2) INFORMATION FOR SEQ ID NO:3:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 402 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..402
- (D) OTHER INFORMATION: /note= "human eosinophil-derived neurotoxin (EDN) ribonuclease"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

|  |     |
|--|-----|
| AAACCGCCGC AGTCACATTG GGCTCAGTGG TTGAAACTC AGCATATCAA CATGACTTCT   | 60  |
| CAGCAGTGCA CTAACGCTAT GCAGGTTATC AACAACTACC AGCGTCGTTG CAAAAACCAG  | 120 |
| AAACACTTCC TGCTGACTAC TTTCGCTAAC GTTGTAAACG TTTGCGTAA CCCGAACATG   | 180 |
| ACTTGCCCGT CTAACAAAAC TCGTAAAAAC TGCCATCATT CTGGTTCTCA GGTTCCGCTG  | 240 |
| ATCCATTGCA ACCTGACTAC TCCGTCTCCG CAGAACATCT CTAACTGCCG TTACGCTCAG  | 300 |
| ACTCCGGCTA ACATGTTCTA CATCGTTGCT TGCAGACAACC GTGACCAGCG TCGTGACCCG | 360 |
| CCGCAGTACC CGGTTGTTCC GGTCATCTG GACCGTATCA TC                      | 402 |

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 3
- (D) OTHER INFORMATION: /product= "OTHER"  
/note= "Xaa = Ser, Tyr or Thr"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Met Lys Xaa Pro  
1

(2) INFORMATION FOR SEQ ID NO:5:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 4 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified-site  
(B) LOCATION: 4  
(D) OTHER INFORMATION: /product= "OTHER"  
/note= "Xaa = Ser, Tyr or Thr"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Met Lys Pro Xaa  
1

(2) INFORMATION FOR SEQ ID NO:6:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 4 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

(A) NAME/KEY: Modified-site  
(B) LOCATION: 3  
(D) OTHER INFORMATION: /product= "OTHER"  
/note= "Xaa = Ser, Tyr or Thr"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

Met Asn Xaa Pro  
1

(2) INFORMATION FOR SEQ ID NO:7:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 4 amino acids  
(B) TYPE: amino acid  
(C) STRANDEDNESS:  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 2
- (D) OTHER INFORMATION: /product= "OTHER"  
/note= "Xaa = Ser, Tyr or Thr"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Met Xaa Lys Pro  
1

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 4 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS:
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(ix) FEATURE:

- (A) NAME/KEY: Modified-site
- (B) LOCATION: 2
- (D) OTHER INFORMATION: /product= "OTHER"  
/note= "Xaa = Ser, Tyr or Thr"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Met Xaa Pro Lys  
1

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 35 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..35
- (D) OTHER INFORMATION: /note= "oligonucleotide SU3"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

AAAAGGCCTC CCGGGACTGG AAGGGCTAAT TCACT

## (2) INFORMATION FOR SEQ ID NO:10:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..29
- (D) OTHER INFORMATION: /note= "oligonucleotide EU5AS"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

CCGGAATTCA CCAGTCGCCG CCCCTCGCC

29

## (2) INFORMATION FOR SEQ ID NO:11:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..30
- (D) OTHER INFORMATION: /note= "oligonucleotide EU5S"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

CCGGAATTCTG CCAAAAAATT TTGACTAGCG

30

## (2) INFORMATION FOR SEQ ID NO:12:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 36 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..36
- (D) OTHER INFORMATION: /note= "oligonucleotide XDGAS"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

GGATCTAGAT CTAGATTGCC CCCCTATCAT TATTGT

36

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 33 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..33
- (D) OTHER INFORMATION: /note= "oligonucleotide SRRES"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

GGACGCGTCG ACACCATTAG GAGTAGCACC CAC

33

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 29 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..29
- (D) OTHER INFORMATION: /note= "oligonucleotide BLU5AS"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

CGCGGATCCA CTGACTAAAA GGGTCTGAG

29

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:  
 (A) NAME/KEY: -  
 (B) LOCATION: 1..23  
 (D) OTHER INFORMATION: /note= "oligonucleotide ENVA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

AGAAATATCA GCACTTGTGG AGA

23

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 25 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:  
 (A) NAME/KEY: -  
 (B) LOCATION: 1..25  
 (D) OTHER INFORMATION: /note= "oligonucleotide ENVB"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

TGAGTGGCCC AAACATTATG TACCT

25

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 26 base pairs  
 (B) TYPE: nucleic acid  
 (C) STRANDEDNESS: single  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:  
 (A) NAME/KEY: -  
 (B) LOCATION: 1..26  
 (D) OTHER INFORMATION: /note= "oligonucleotide ENVC"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

CACCACTCTA TTTTGTGCAT CAGATG

26

## (2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 23 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..23
- (D) OTHER INFORMATION: /note= "oligonucleotide IRESA"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

GCTCTAGAGG AATTCCGCC CTC

23

## (2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..25
- (D) OTHER INFORMATION: /note= "oligonucleotide IRESB"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

GACTAGTGGC AAGCTTATCA TCGTG

25

## (2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 32 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..32
- (D) OTHER INFORMATION: /note= "oligonucleotide EDNalpha"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

CGCGGATCCT TGATATGCTG AGTTTCGAAC CA

32

(2) INFORMATION FOR SEQ ID NO:21:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 40 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..40
- (D) OTHER INFORMATION: /note= "oligonucleotide EDNomega"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

AAGGAAAAAA GCGGCCGCCT ACTAGATGAT ACGGTCCAGA

40

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 19 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

(ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..19
- (D) OTHER INFORMATION: /note= "oligonucleotide ECOSPL"

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

GGGCGGCGAC TGGTGAATT

19

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 22 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA

## (ix) FEATURE:

- (A) NAME/KEY: -
- (B) LOCATION: 1..22
- (D) OTHER INFORMATION: /note= "oligonucleotide OTESAPL"

## (xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

TCTAACACTT CTCTCTCCGG GT

22